SECTION 05310

METAL ROOF DECK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes
   1. Metal roof deck and accessories as shown or specified.

B. Related Sections
   1. Metal floor deck - Section 05315.
   2. Field painting of metal deck - Division 9.
   3. Roof drains - Division 15.

1.2 SUBMITTALS

A. Furnish submittals for items that are identified in this Section by a different typeface and a bracketed code (e.g., *Item [L]*). Refer to Section 01340 for definition of codes for types of submittals and the administrative requirements governing submittal procedure. Additional submittal requirements pertaining to this Section are specified under this Article.

B. *Detailed Shop Drawings [D]:* Submit to show deck sheet layout with openings, cut outs, closures, cants, roof drain pans, ridge and valley plates, saddles and reinforcing, finish or paint. Submit details of roof drain pans.
   1. Manufacturer's Product Data: Submit for deck unit profile, gage, section properties, and allowable diaphragm shear for specific deck and fastening method proposed. Include certification of minimum thickness of each sheet used.

1.3 DELIVERY, STORAGE AND HANDLING

A. Properly store, handle and erect material. Replace or repair damaged material before erection, at no additional cost to Owner.

B. Properly store and transport galvanized steel per American Galvanizers Association's recommended procedures to prevent wet storage stain.

1.4 PROJECT CONDITIONS

A. Do not use placed units as storage or working surface until after units have been permanently fastened in position. Do not damage or overload roof deck during construction period.

PART 2 PRODUCTS

2.1 MATERIALS

A. Wherever specific gage of steel sheet is specified in this Section, followed by minimum thickness in inches, minimum inch thickness shall govern based on bare, uncoated sheet. There shall be no tolerance under specified minimum inch thickness. Use the following:
   1. Cold-rolled carbon steel sheet, ASTM A 611, Grade C, cleaned, chemically treated and painted with manufacturer's standard gray rust-inhibitive primer of minimum 0.5 mil dry film thickness, each side.
   2. Galvanized steel sheet, ASTM A 446, Grade A, hot-dipped galvanized to coating designation G-90, minimized spangle, chemical treatment per ASTM A 525.

B. Steel angles shall be hot rolled carbon steel ASTM A 36.
   1. Hot-dipped galvanized with minimum zinc coating of 2 ounces per square foot per ASTM A 123.

C. Vapor-Proof Deck Materials:
   1. Joint Sealing Material: Non-skinning, gun-grade, bulk compound conforming to requirements of National Association of Architectural Metal Manufacturer's Association Specification.
   2. Flexible Closure Strips: Elastomeric, vulcanized, closed cell neoprene or EPDM rubber, to fit deck profile and be under compression. Submit 12 inch long sample.

D. Fasteners: For securement of metal roof decks:
   1. Powder-actuated, drive pin type adequate to penetrate into steel members. Fasteners and low-velocity powder-actuated tools by:
      a. Hilti Fastening Systems, Inc.
      b. Ramset Fastening System.
   2. Self-drilling, self-tapping, 12-24 support fasteners with hex washer head.
      a. ITW Buildex.
   3. Stitch, 10-16 side fasteners with hex washer head and pilot point:
      a. ITW Buildex.
   4. Air-actuated, adequate to penetrate into steel members. Fasteners and low-velocity air-activated tools by:
      a. Pneutek, Inc.
      b. Hilti, Inc.

2.2 MANUFACTURED UNITS

A. Provide roof deck units to span at least three spans. Where not practical, provide units to span two spans, but only where so approved on shop drawings. Fabricate deck and accessories per AISI "Specifications for Design of Cold-Formed Steel Structural Members" and SDI "Standard No. 1 - Basic Design Specifications" except where other requirements are specified.
   1. 1-1/2 Inch Deep Deck.: Fabricate of 18 gage (design thickness is .0478 inch) specified steel sheet. Provide wide rib deck conforming to Steel Deck Institute type WR.
      a. Bowman Metal Deck, Cyclops Corporation "B".

b. Consolidated Systems Inc. “B”.
c. Epic Metals Corporation “B”.
d. Roll Form Products, RFP Inc. “B16RD”.
e. United Steel Deck Inc. “B”.
f. Vulcraft, Nucor Corporation “1.5B”.
g. Wheeling Corrugating Company, Wheeling-Pittsburgh Steel Corporation “BW”.

2.3 ACCESSORIES

A. Fabricate ridge and valley plates from 18 gage sheet of same metal and finish as for roof deck units. Fabricate from single width sheets and in sections as long as practical. Fabricate to form transition slopes required, not less than 4.5 inches effective width, with 3 inch flanges for securing to roof deck.

B. Fabricate metal closures from 18 gage sheet of same metal and finish as for roof deck units and of configuration required to provide tight fitting closures at open ends and sides of roof deck units.
   1. Fabricate metal closure on backside of parapets, expansion joints, equipment curbs, and at intersection of roof and walls of same metal and finish as for roof deck units. Fabricate from single width sheets and in sections as long as practical. Provide top and bottom flanges of not less than 3 inches. Gage for span of closure shall be:

Span	Gage
Up to 10 inches	18
10 to 16 inches	16
16 to 24 inches	14
Over 24 inches	as shown on drawings

C. Fabricate roof drain pans from 14 gage sheet of same metal and finish as for roof deck units. Pans shall be approximately 29 inches by 33 inches in overall size, of sloped design to fit roof slope, and formed with depressed, flat bottom 1-1/2 inches below adjacent roof deck surface at low side. Provide flanged edges to fit flat on top of roof deck.

D. Hanger tabs shall not be permitted.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install roof deck to comply with requirements for Class I roof deck installation of Factory Mutual Systems, FM 1-28, based on a 110 mile per hour wind speed. If powder-actuated or air-actuated tools/fasteners are used, comply with State and Federal regulations and with ANSI A10.3. Clean top and bottom surfaces of deck of mud, dirt and other contaminants, before start of installation.

B. Supporting members shall be properly installed and fastened before placing roof deck units. Place roof deck units on supporting steel framework and adjust to final position with ends bearing on supporting members. Lap end joints 2 inches minimum. Align flutes longitudinally before fastening deck permanently. Lap side joints by nesting with adjacent units. Place and align roof deck units to maintain required number of units shown on approved shop drawings, and to prevent stretching or contracting of side-laps.

C. Secure roof deck units to framing by electric arc welding, per AWS D.1.Provide 3/4 inch long fillet welds, 1/2 inch diameter puddle welds, or equivalent, spaced 12-inches maximum on centers at each supporting member. Provide No. 10 self-tapping screws to secure nested rib edges together, at each support and at mid-point between supports, but at not more than 3 feet on center between supports. Do not combine deck welds and overlap rib welds. Use true fusion welds, not burning or sticking type welds.

D. Alternately, at Contractor's option, secure roof deck to framing by specified fasteners, spaced 12-inches maximum on center at each supporting member. Provide No. 12 self-tapping screws to secure nested rib edges together, or use specified fasteners; place at each support and at mid-point between supports but at not more than 3 feet on center between supports.

E. Provide sealed end lap and side lap joints in roof deck installation where vapor-proof area is shown. Side laps shall be field-sealed; seal end laps in field as deck units are installed. In addition, furnish and install flexible closure strips, in flutes of deck underside, at supports, to provide effective sealing-off areas.

F. Set roof drain pans in proper location for roof drains, with bottoms level. Weld pans to roof deck with tack welds at 6 inch centers around perimeter of pan.

G. Provide required holes in roof deck for roof drain pans, passage of pipes, duct and structural supports, equipment and other openings, and similar construction. Provide steel angle framing at two sides of openings where structural capacity of roof deck is impaired by cutting of deck , where building framing is not provided. Use angles 18 inches longer than opening width, placed at right angles to deck ribs, welded to bottom of each rib.

H. Provide metal closure strips at open, uncovered longitudinal edges of roof deck units, and at junction between deck units running in different axis, secured in place. In addition, provide metal closures in voids between metal roof deck units and top of walls and partitions where so shown. Provide metal filler strips under prefabricated curbs supporting roof top units.
   1. Provide metal closures on backside of parapets.

3.2 REPAIR/RESTORATION

A. Wire-brush, clean and touch-up paint scarred areas on top and bottom surfaces of deck to leave deck in condition ready for field painting. Scarred areas include welds, weld scars, abraded surfaces, bruises and rust spots. Use zinc-rich paint on galvanized surfaces and on weld burns.

3.3 FIELD QUALITY CONTROL

A. Examine placed deck for tears, dents or other damage that may compromise structural integrity of decking. Report damage to Registered Design Professional for determination of any required repairs.

B. Examine air-actuated fasteners to insure steel roof deck is properly clamped to support steel. Verify fastener nail head standoff is within manufacturer's accepted tolerance. Replace under-driven and over-driven fasteners with adjacent properly installed fasteners.

3.4 CLEANING

A. Upon completion of roof deck installation, clean top and bottom surfaces of deck free from mud, dirt, weld spatters and other contaminants to leave deck in condition ready for field painting.

END OF SECTION

Revision History	
Date	**Rev. No.**
A	0
B	0
C	0
D	0
E	0
F	0
02-19-09	0

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